

# Decision Document

Solid Waste Management Units B-30  
Building 101-16 Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



October 1999



Hawthorne Army  
Depot



# Decision Document SWMU B-30

October 1999

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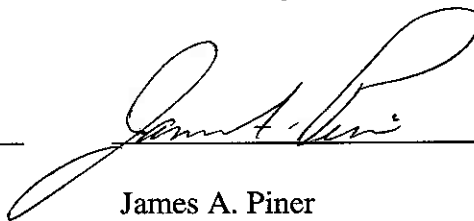
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ENVIRONMENTAL PROTECTION

The selected remedy is protective of human health and the environment. It has been shown that a complete pathway to human health and the environment does not exist, and there is no potential for an exposure pathway to be completed in the future.

**U. S. Army**

4 Nov 99



James A. Piner  
Lieutenant Colonel, U.S. Army

**State of Nevada**

22 Nov 99



Paul Liebendorfer  
Chief, Bureau of Federal Facilities

# Decision Document

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Building 101-16 Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



October 1999



Hawthorne Army  
Depot



**Decision Document**  
**SWMU B-30, Building 101-16 Catchment Pit**  
**Hawthorne Army Depot**  
**Hawthorne, Nevada**

**1.0 Introduction:**

This decision document describes the rationale for the proposed closure of SWMU B-30, Building 101-16 catchment pit, at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. This document was prepared by the U.S. Army Corps of Engineers, Sacramento District, HWAD and the Nevada Department of Environmental Protection (NDEP).

Tetra Tech, Inc. (Tt), was tasked by the US Army Corps of Engineers, Sacramento District (USACE), to perform remedial investigations and ground water monitoring at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. These tasks were conducted from 1993 through 1997, primarily at solid waste management units (SWMUs) designated by the Army and the Nevada Division of Environmental Protection (NDEP). The NDEP is the lead regulatory agency for environmental issues at HWAD. The purpose of the monitoring was to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, present conclusions, and recommend any remediation, if necessary.

With guidance from the NDEP, basewide proposed closure goals (PCGs) for soil were established as acceptable levels so that SWMU closure could be recommended and to assist in directing the investigative efforts toward those SWMUs where the target analytes were of greatest concern (Appendix B). These PCGs were used as action levels throughout this investigation and are used for comparison with the detected analytes in this report.

**2.0 Site History**

SWMU B30 is in the HWAD's central magazine area, on the northwest side of the 101 Production Area (Figure 1-1). SWMU B30 is an inactive unlined catchment pit located 175 feet northwest of Building 101-16 (Figure 1-2). The catchment pit measures 78 feet by 30 feet and is up to six feet deep. The catchment pit was partially destroyed by channel erosion at the southeast corner.

The USACE, HWAD, and the NDEP agreed to define the boundaries of each SWMU using annotated monuments and survey pins. As part of E&E's 1997 field investigations a survey monument was constructed and surveyed at SWMU B30. A brass survey pin on the monument designates the monument number HWAAP-103-1996 and the SWMU number B30. Three corner pins were set and surveyed to define the SWMU boundary with the monument as the northwest corner. The location of these corner markers and the SWMU boundaries are shown on Figure 1-2. Survey data is presented in Appendix A.

### **3.0 Site Conditions**

Soils encountered at SWMU B30 include silts; silty sands; and sand, silt, and gravel mixtures. Silts were typically present near the surface of each hand auger location. Below this, the soils graded to coarser-grained materials.

USAEHA estimated the depth to ground water in the vicinity of SWMU B30 at approximately 120 feet below ground surface (bgs) (USAEHA 1988). During Tt's 1997 first and second quarter ground water monitoring (Tt 1997a, 1997b), the depth to ground water was measured at approximately 100 feet bgs at wells IRPMW30 and IRPMW31. These wells are approximately 500 feet downgradient to the northwest of SWMU B30.

Based on the designated target analytes, all soil samples collected during this remedial investigation were analyzed for metals, explosives, picric acid, nitrate, and pH. After the investigations the chemicals of concern for the SWMU were explosives.

### **4.0 Investigations**

Site inspections of SWMU B30 were conducted by the USAEHA (1988), Jacobs Engineering (1988), and RAI (1992). During these inspections, red stained soil was noted in and around the catchment pit. No investigation activities were conducted during these inspections, and no samples were collected from the SWMU at that time; however, based on visual evidence it was assumed that the red stained soil was evidence of high levels of TNT contamination. In 1989, WaterWork Corporation conducted a ground water investigation in response to a July 1987 closure order issued for the 101 Production Area by the NDEP (WaterWork 1990). In 1994, sampling activities proposed by E&E for the remedial investigation at SWMU B30 included collecting and analyzing surface, near-surface, and subsurface soil samples, and sampling the ground water by hydropunch (fig 3-1). However, refusal was encountered during the CPT sounding, and ground water was not encountered; therefore, the planned depth of the boring was not completed and a ground water sample was not collected (E&E 1995).

In late 1998 questions began to arise that the red stained soil may not be explosives contaminated soil; and as in other SWMU's, the high levels of explosives contamination detected by field test methods were not being confirmed by laboratory analysis. The Corps of Engineers took samples of the stained soil in January 1999 from several sites in the 101 area including SWMU B-30. When the samples taken from B-30 did not indicate any explosives contamination, it was determined to sample the SWMU for closure. In March of 1999 The Corps of Engineers took soil samples from SWMU B-30 as a confirmation sampling event (fig. 4).

## 5.0 Investigation Results

Field sampling was conducted in 1994 and 1997 at SWMU 30. Of six surface and near surface samples taken in 1994; two exhibited high levels of TNT and RDX contamination in the field screening tests. Laboratory results of the same samples did not support any TNT or RDX concentrations above PCG's (appendix C). Sampling in 1999 supported the previous laboratory data by showing no TNT or RDX levels above PCG's. The Corps of Engineers sampling event of January 1999 indicated that the stained soil in B-30 did not indicate any explosive's contamination above PCG's. The red staining was determined to be either bacteria, a photodegradation product of TNT, a dye used in production or natural soil coloration. In March of 1999 the Corps of Engineers collected eight samples from SWMU B-30. Table 1-1 is a summary of the results of the analysis and appendix D lists the complete analysis.

TABLE 1-1

SWMU B-30						
CONFIRMATION SAMPLE RESULTS						
Sample Number	TNT (ppm)	RDX (ppm)		Sample Number	TNT (ppm)	RDX (ppm)
CS30-BB-01	<0.26	<0.26		CS30-SW-01	<0.26	<0.26
CS30-BB-02	<0.26	<0.26		CS30-SW-02	<0.26	9.05
				CS30-SW-03	<0.26	0.33
CS30-SA-01	<0.26	<0.26		CS30-SW-04	<0.26	0.48
CS30-SA-02	<0.26	<0.26				

The largest detection was a hit of RDX at 9.05 mg/kg, which is below the PCG's for RDX.

## 6.0 Remediation

No remediation at this SWMU

## 7.0 Remediation Results

Not Applicable

## 8.0 Public Involvement:

It is the U.S. Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository library at the local public library. This repository includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD the repository shall be updated.

HWAD has solicited community participation in establishment of a restoration and advisory board (RAB). To date there has been insufficient response and HWAD has not

formed a RAB. HWAD has held open houses to inform the public of on going environmental issues. HWAD continues to solicit community involvement, and will establish a RAB should sufficient community interest be obtained.

## **9.0 Conclusions and Recommendations**

Based on investigation results the basin at SWMU B-30 was backfilled with completed compost material, with a 3" cover of clean soil on top. It is recommended that SWMU B-30 be closed with the restriction that no structure be constructed on the area where the basin was backfilled.



## 10.0 REFERENCES

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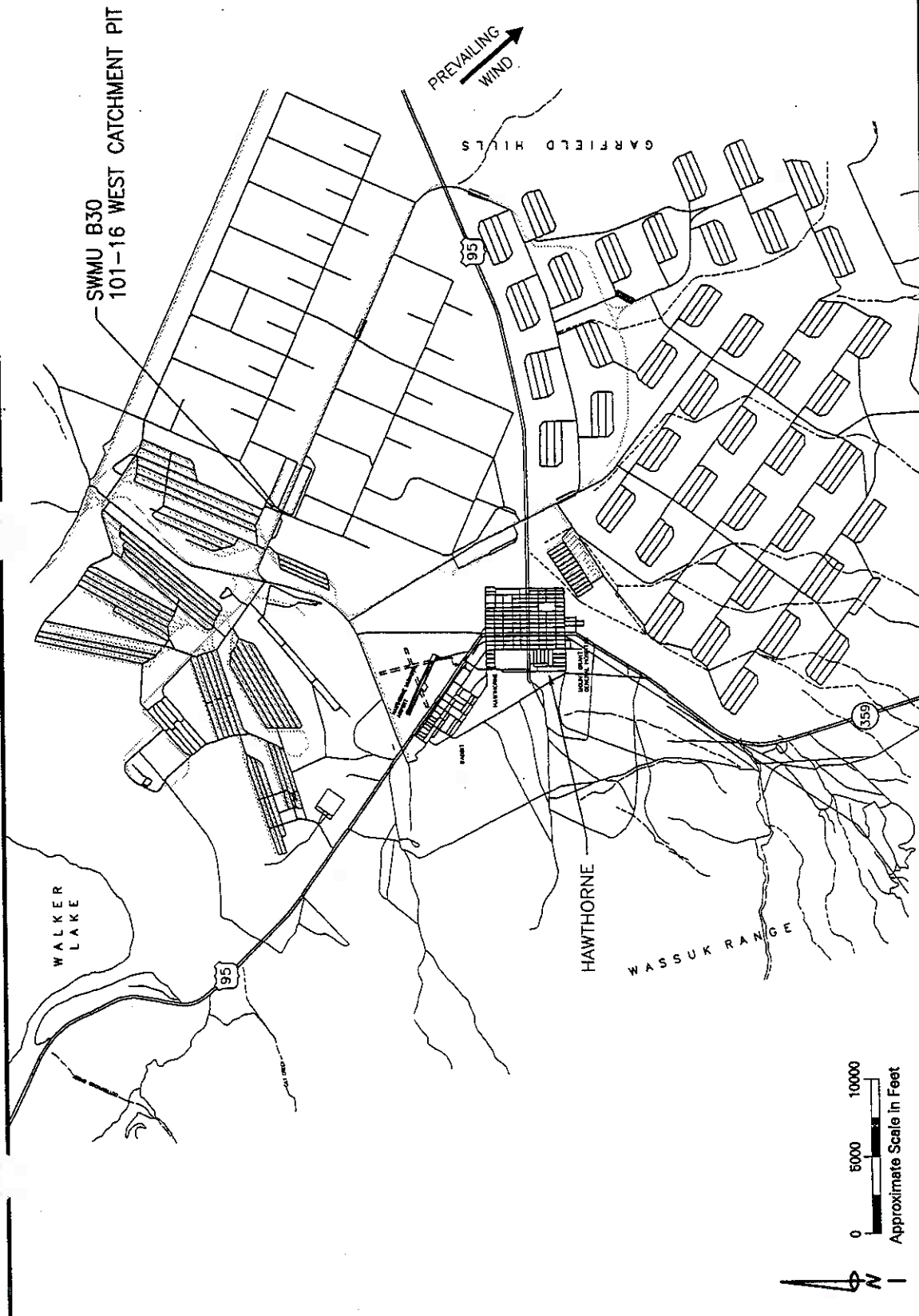
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\_\_\_\_\_. 1996. Region IX Preliminary Remediation Goals. USEPA Region IX. August 1996.

WaterWork. 1990. Hawthorne Army Ammunition Plant, Area 101 Surface Impoundments, Field and Lab Data and Analysis, Attachment 1-8.

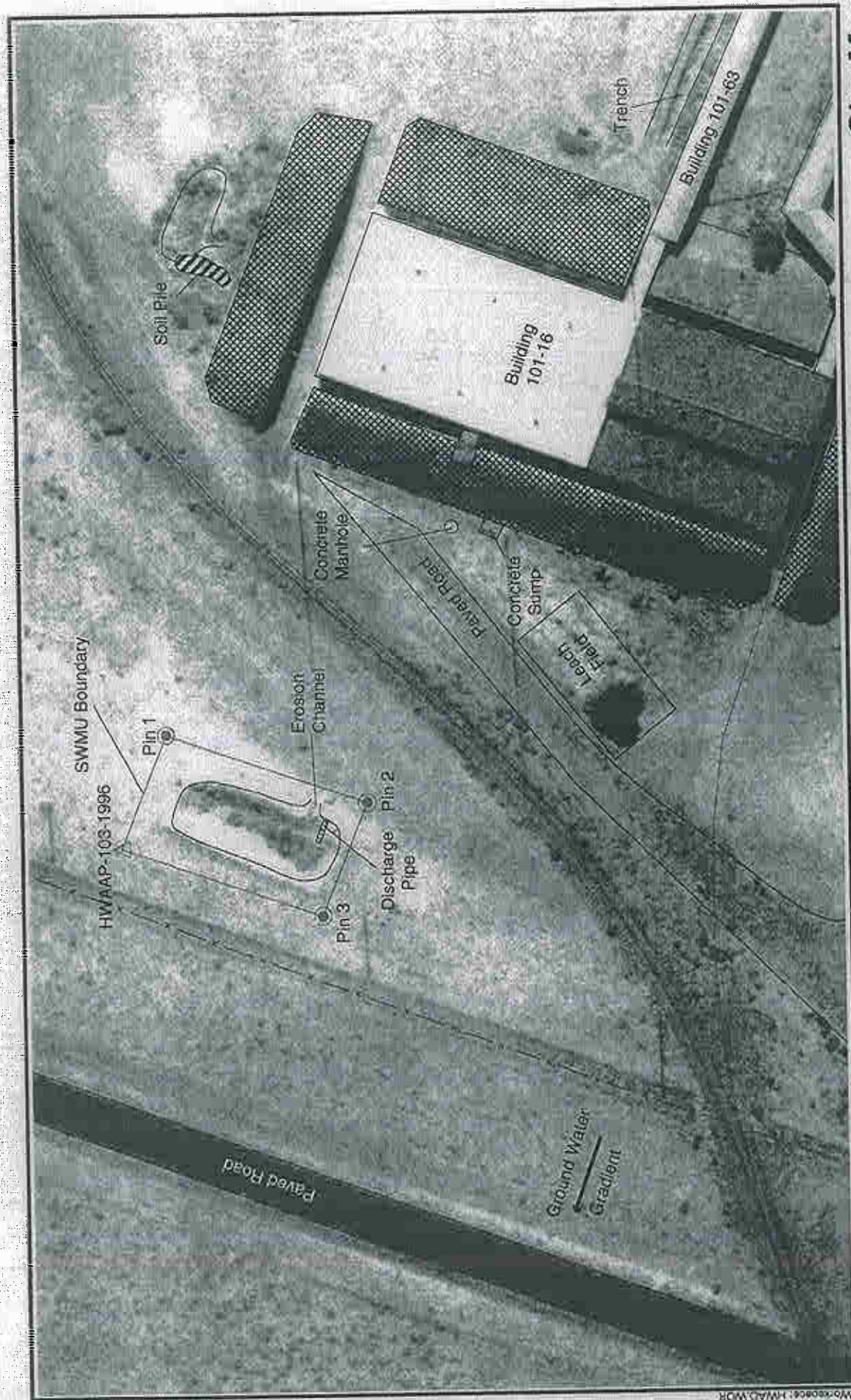


SOURCE: TETRA TECH FINAL DATA PACKAGE, 1996 (REV. 1997)

# **Location Map** **SWMU B30** **101-16 West Catchment Pit**

Hawthorne Army Depot  
Hawthorne, Nevada

**Figure 1-1**



**Site Map**  
**SWMU B30**  
**101-16 West Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada  
**Figure 1-2**

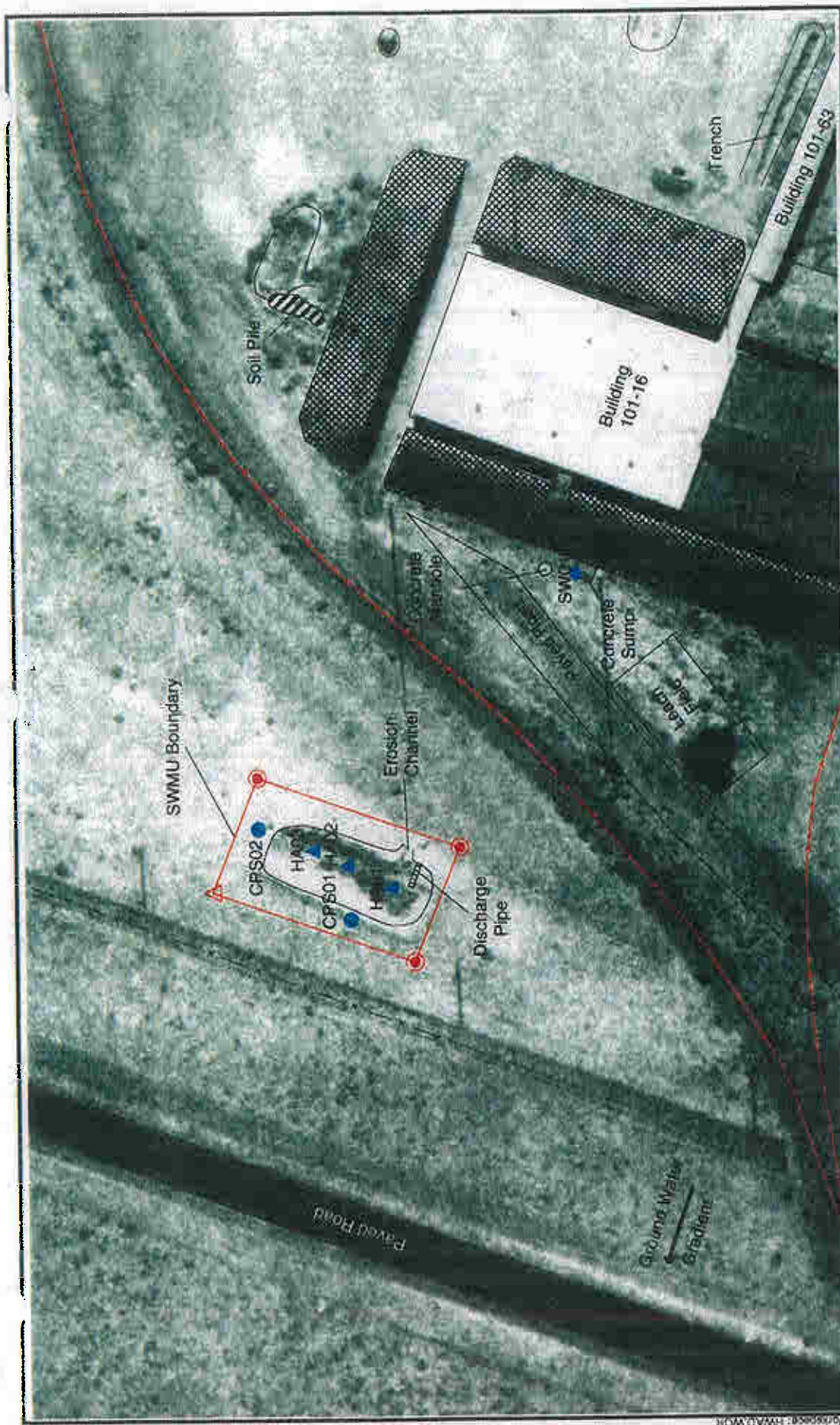
**Legend:**

- Boundary Corner Pin
- ⊗ Explosion Barrier
- Fence
- ++++ Railroad
- △ SWMU Monument



W0408061.HWAD.WDR





**Investigation Activity Map**  
**SWMU B30**  
**101-16 West Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada

**Figure 3-1**

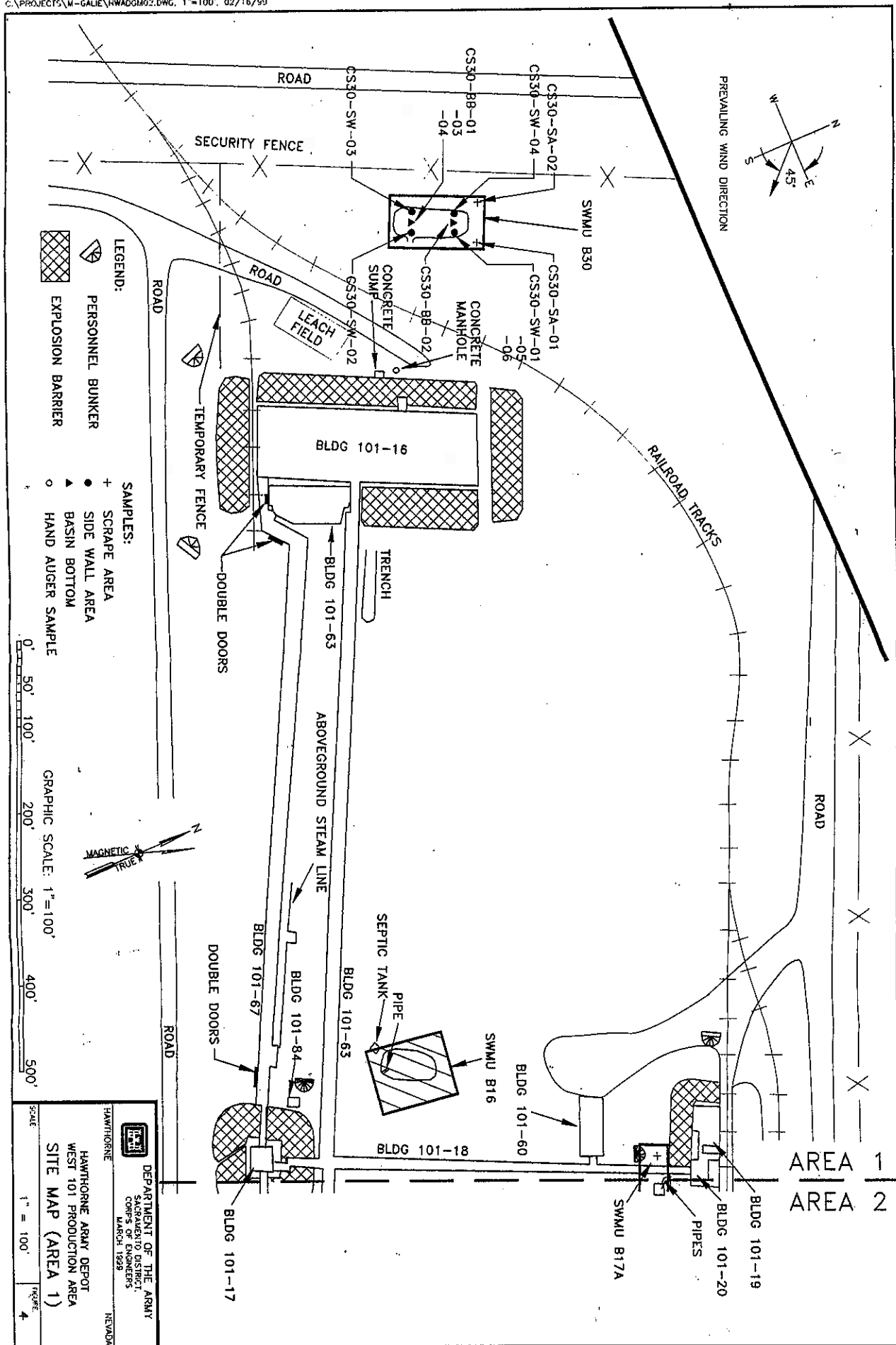
**Legend:**

- Boundary Corner Pin
- Hand Auger Location
- Soil Boring Location
- Sump Water Sample
- Explosion Barrier
- Fence
- Railroad
- SWMU Monument

Ground Water  
 Erosion Channel  
 Discharge Pipe  
 Leach Field  
 Concrete Sump  
 Trench  
 Building 101-63  
 Building 101-16  
 Soil Pile  
 SWMU Boundary  
 CPS02  
 HA03  
 CPS01  
 HA02


0 35 70  
 Approximate Scale in Feet

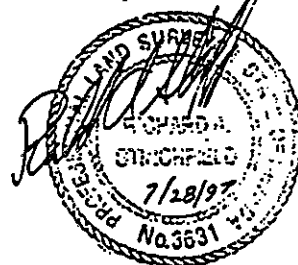
**Tetra Tech, Inc.**



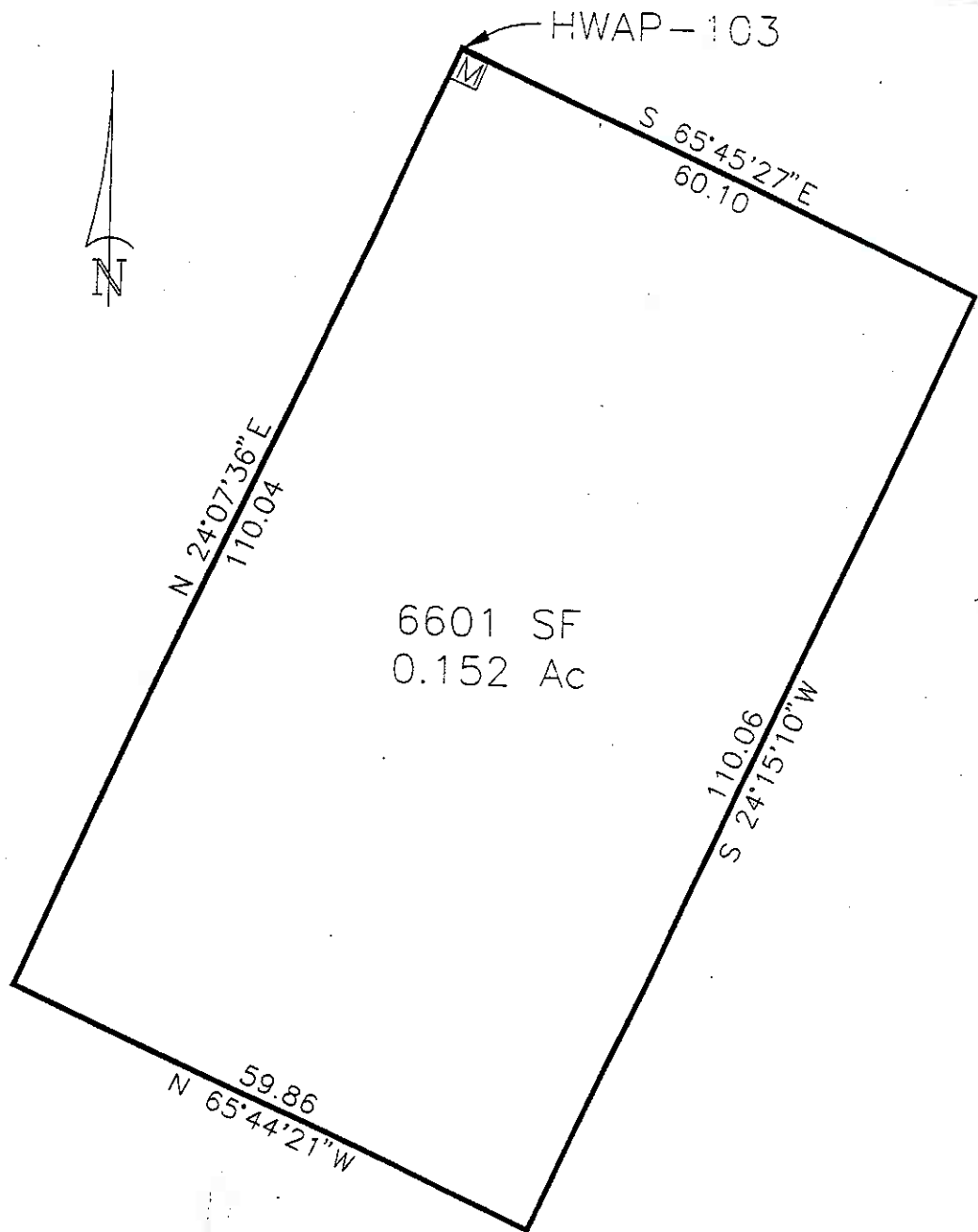
## **Appendix A**

## NOTES

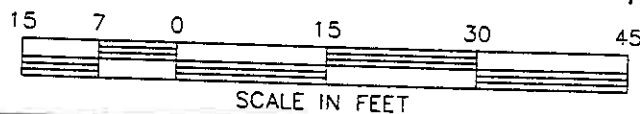
1. FOR THE LOCATION OF THE FOLLOWING SWMU'S, REFER TO FIGURE 3-6 OF THE "FINAL R.C.R.A. FACILITY INVESTIGATION REPORT OF GROUP "A" SOLID WASTE MANAGEMENT UNITS A-04, B-16, B-21, B-24, B-26, AND H-01".
2. THE "HWAD" MONUMENTS AS SHOWN HEREIN AS , ARE A 1' X 1' X 2'+ CONCRETE MONUMENT WITH A BRASS CAP STAMPED AS PER SPECIFICATIONS. ALL OF THE OTHER CORNERS ARE MARKED BY A 5/8" RE-BAR WITH A PLASTIC CAP STAMPED "STINCHFIELD PLS 3631" UNLESS NOTED OTHERWISE ON THE MAPS.
3. HORIZONTAL DATUM IS BASED ON NAD 83(1994) AND MORE SPECIFICALLY, NGS STATION "W 2". "W 2" IS A FEDERAL BASE NETWORK CONTROL STATION AND IS LOCATED IN THE APPROXIMATE CENTER OF THIS PROJECT.
4. VERTICAL DATUM IS BASED ON NAVD 29. NAVD 88 ELEVATIONS HAVE BEEN SCALED AND THEREFORE ARE NOT ACCURATE. VERTICAL CONTROL USING GPS WAS USED TO ESTABLISH THE ELEVATIONS OF THE EXISTING CONTROL POINTS AND THE "HWAD" MONUMENTS. THE VALUE OF NGS STATION "W 2" WAS USED AS A BASIS FOR THE VERTICAL CONTROL.
5. COORDINATE VALUES OF EXISTING NGS CONTROL, TRAVERSE POINTS, AND HWAD MONUMENTS ARE STATE PLANE COORDINATES, WEST ZONE.
6. THE COMBINED FACTOR WAS CALCULATED USING THE FOLLOWING FIGURES. THE "MAP SCALE" AT POINT "W 2" IS 0.99990022, THE MEAN ELEVATION OF THE TOTAL PROJECT WAS TAKEN AS 4150.00 FEET ABOVE SEA LEVEL AND THE MEAN RADIUS OF THE EARTH WAS TAKEN AS 20,906,000 FEET. THE SEA LEVEL FACTOR WAS CALCULATED AS FOLLOWS:  $20,906,000 / 20,906,000 + 4150.00 = 0.999801532$ . THE COMBINED FACTOR (CF) WAS CALCULATED AS FOLLOWS:  $0.99990022 \times 0.999801532 = 0.999701772$ .
7. GROUND DISTANCE X CF (0.999801532) = GRID DISTANCE.
8. GRID DISTANCE X INVERSE CF (1.00298317) = GROUND DISTANCE.
9. COORDINATE VALUES OF ALL OTHER POINTS INCLUDING SWMU CORNERS OTHER THAN "HWAD" MONUMENTS, REFERENCE POINTS, TEST PIT OR HOLE LOCATIONS ETC., WERE CALCULATED USING GROUND DISTANCES AND ARE THEREFORE NOT TRUE STATE PLANE COORDINATES.
10. DISTANCES AS SHOWN ON THESE SWMU'S ARE HORIZONTAL GROUND DISTANCES.







NW COR	N	14514175.557	E	2621192.813	ELEV	4179.340
NE COR	N	14514150.880	E	2621247.613	ELEV	4179.251
SE COR	N	14514050.535	E	2621202.405	ELEV	4179.561
SW COR	N	14514075.130	E	2621147.834	ELEV	4179.623



SWMU B30 Survey Data  
Hawthorne Army Depot  
Hawthorne, Nevada

SWMU	Point ID	Northing (feet)	Easting (feet)	Elevation
B30	CPS01	1390751.36	496776.21	NE
B30	CPS02	1390796.36	496826.11	NE
B30	HA01	1390730.36	496789.51	NE
B30	HA02	1390752.36	496802.91	NE
B30	HA03	1390769.36	496812.51	NE
B30	HWAAP-103-1996	1390819.86	496796.90	4179.56
B30	Pin 1	1390795.18	496851.70	4179.62
B30	Pin 2	1390694.84	496806.49	4179.34
B30	Pin 3	1390719.43	496751.92	4179.25

Notes:

NE = Not established

Coordinate data based on electronic map file using the NAD 1927 datum.

Elevation data based on surveyors map using NGVD 1929 datum.

## **Appendix B**

**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S <sup>a</sup>
2-Amino-dinitrotoluene	Explosive	NC	-	NA <sup>a</sup>
4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	160	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
Tetryl	Explosive	NC	800	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	4	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	233	Calculated Subpart S
Aluminum	Metal	NC	80,000	Calculated Subpart S
Arsenic (cancer endpoint)	Metal	C & NC	30	Background <sup>c</sup>
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG <sup>d</sup>
Mercury and compounds (inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit <sup>e</sup>
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NOEP Level Clean-up <sup>f</sup>
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA <sup>g</sup>
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S

**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Butyl benzyl phthalate	SVOC	NC	16,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC			NA
Phenol	SVOC	NC	48,000	Calculated Subpart S
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl)ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	16,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC			NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCDD	Dioxin	C	0.000005	Calculated Subpart S

<sup>a</sup> RCRA 55 FR 30870

<sup>b</sup> Not available

<sup>c</sup> Highest background concentration detected in 50 background soil samples

<sup>d</sup> Smucker, Stanford J. USEPA Region IX, Preliminary Remedial Goals, Second Half, Sep. 1995

<sup>e</sup> Method detection limit for Volatile Organic Compounds by EPA Method 8260 or

<sup>f</sup> Semi-Volatile Organic Compounds analyzed by EPA Method 8270

<sup>g</sup> Nevada Division of Environmental Protection

<sup>h</sup> Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

## **Appendix C**

Metals  
Method 6010A (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium Total mg/kg	Silver mg/kg	Arsenic mg/kg	Lead mg/kg	Selenium mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	88	<0.52	<0.52	5.8	<1	NA	NA	NA
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	78	<0.6	<0.6	4.3	<1.2	4.5	5.5	<0.6
B30-HA1-3-005	HA03	3/28/91	5	ASC	56	<0.51	<0.51	3	<1	0.9	2	<0.51
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	210	<0.62	<0.62	7.2	<1.2	6.4	8.1	<0.62
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	450	0.8	<0.62	8.2	<1.2	20	14	<0.62
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	60	<0.53	<0.53	4.1	<1.1	5.4	2.6	<0.53
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	140	0.57	<0.56	3.5	<1.1	11	6.5	<0.56
B30-HA1-1-000	HA01	5/12/94	0	ASC	100	<0.53	<0.53	6.3	<1	5.8	12	<1
B30-HA1-1-005	HA01	5/12/94	5	ASC	32	<0.5	<0.5	2.5	<1	1.3	2.1	<0.5
B30-HA1-2-000	HA02	5/12/94	0	ASC	130	0.61	2.4	15	<1.2	8.3	41	<1.2
B30-HA1-2-005	HA02	5/12/94	5	ASC	220	0.91	<0.64	11	<1.3	8.8	8.8	<1.3
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	200	0.68	<0.66	11	<1.3	8.6	9.6	<0.66
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	260	<0.55	<0.55	4.8	<1.1	36	5.7	<0.55
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	230	0.96	<0.67	14	<1.3	7	10	<0.67
Analyses					14	14	14	14	14	13	13	13
Detections					14	6	1	14	0	13	13	0
Minimum Concentration					32	0.57	2.4	2.5	0	0.9	2	0
Maximum Concentration					450	0.96	2.4	15	0	36	41	0
HWAD - PCG					2000	1	20	20	100	100	100	20
HWAD - PCG Hits					0	0	0	0	0	0	0	0

Note:

NA = Not analyzed

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.



Arsenic  
Method 7060 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Arsenic mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	5.9
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	4.5
B30-HA1-3-005	HA03	3/28/91	5	ASC	0.9
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	6.4
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	20
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	5.4
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	11
B30-HA1-1-000	HA01	5/12/94	0	ASC	5.8
B30-HA1-1-005	HA01	5/12/94	5	ASC	1.3
B30-HA1-2-000	HA02	5/12/94	0	ASC	8.3
B30-HA1-2-005	HA02	5/12/94	5	ASC	8.8
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	8.6
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	36
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	7
Analyses					14
Detections					14
Minimum Concentration					0.9
Maximum Concentration					36
HWAD - PCG					100
HWAD - PCG Hits					0

Lead  
Method 7421 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Lead mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	12
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	5.5
B30-HA1-3-005	HA03	3/28/91	5	ASC	2
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	8.1
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	14
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	2.6
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	6.5
B30-HA1-1-000	HA01	5/12/94	0	ASC	12
B30-HA1-1-005	HA01	5/12/94	5	ASC	2.1
B30-HA1-2-000	HA02	5/12/94	0	ASC	41
B30-HA1-2-005	HA02	5/12/94	5	ASC	8.8
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	9.6
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	5.7
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	10
Analyses					14
Detections					14
Minimum Concentration					2
Maximum Concentration					41
HWAD - PCG					100
HWAD - PCG Hits					0

Mercury  
Method 7471 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Mercury mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	<0.1
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	<0.12
B30-HA1-3-005	HA03	3/28/91	5	ASC	<0.1
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	<0.12
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	<0.12
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	<0.11
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	<0.11
B30-HA1-1-000	HA01	5/12/94	0	ASC	<0.084
B30-HA1-1-005	HA01	5/12/94	5	ASC	<0.1
B30-HA1-2-000	HA02	5/12/94	0	ASC	0.2
B30-HA1-2-005	HA02	5/12/94	5	ASC	<0.13
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	<0.13
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	<0.11
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	<0.13
Analyses					14
Detections					1
Minimum Concentration					0.2
Maximum Concentration					0.2
HWAD - PCG					24
HWAD - PCG Hits					0

Selenium  
Method 7740 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Selenium mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	<1
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	<0.6
B30-HA1-3-005	HA03	3/28/91	5	ASC	<0.51
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	<0.62
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	<0.62
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	<0.53
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	<0.56
B30-HA1-1-000	HA01	5/12/94	0	ASC	<1
B30-HA1-1-005	HA01	5/12/94	5	ASC	<0.5
B30-HA1-2-000	HA02	5/12/94	0	ASC	<1.2
B30-HA1-2-005	HA02	5/12/94	5	ASC	<1.3
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	<0.66
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	<0.55
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	<0.67

Analyses	14
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	20
HWAD - PCG Hits	0

Note:

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives  
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	2,4,6-TNT mg/kg	2,4-Dinitrotoluene mg/kg	2,6-Dinitrotoluene mg/kg	2-Amino-4,6-DNT mg/kg	2-Nitrotoluene mg/kg	3-Nitrotoluene mg/kg	4-Amino-2,6-DNT mg/kg	4-Nitrotoluene mg/kg	HMX mg/kg	m-Dinitrobenzene mg/kg	Nitrobenzene mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	0.24 <sup>J</sup>	<1	<1	0.26 <sup>J</sup>	<1	<1	0.5 <sup>J</sup>	<1	<1	<1	<1
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-HA1-3-005	HA03	3/28/91	5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	<1	<1	<1	0.7 <sup>J</sup>	<1	<1	<1	<1	1.1	<1	<1
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	<1	<1	<1	0.71 <sup>J</sup>	<1	<1	<1	<1	2.6	<1	<1
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-HA1-1-000	HA01	5/12/94	0	ASC	<1	<1	<1	<1	<1	<1	0.5 <sup>J</sup>	<1	<1	<1	<1
B30-HA1-1-005	HA01	5/12/94	5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-HA1-2-000	HA02	5/12/94	0	ASC	0.15 <sup>J</sup>	<1	<1	0.29 <sup>J</sup>	<1	<1	0.81 <sup>J</sup>	<1	<1	<1	<1
B30-HA1-2-005	HA02	5/12/94	5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Analyses					14	14	14	14	14	14	14	14	14	14	14
Detections					2	0	0	4	0	0	3	0	2	0	0
Minimum Concentration					0.15	0	0	0.26	0	0	0.5	0	1.1	0	0
Maximum Concentration					0.24	0	0	0.71	0	0	0.81	0	2.6	0	0
HWAD - PCG					233	2.6	80	NE	800	800	NE	800	4000	8	40
HWAD - PCG Hits					0	0	0	NE	0	0	NE	0	0	0	0

Notes:

NE = Not established

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives  
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	RDX mg/kg	sym-Trinitrobenzene mg/kg	Tetryl mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	<1	<1	<1
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	<1	<1	<1
B30-HA1-3-005	HA03	3/28/91	5	ASC	3.6	<1	<1
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	1.1	<1	<1
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	0.83 J	<1	<1
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	0.47 J	<1	<1
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	1.1	<1	<1
B30-HA1-1-000	HA01	5/12/94	0	ASC	3.9	<1	<1
B30-HA1-1-005	HA01	5/12/94	5	ASC	1.7	<1	<1
B30-HA1-2-000	HA02	5/12/94	0	ASC	<1	<1	<1
B30-HA1-2-005	HA02	5/12/94	5	ASC	<1	<1	<1
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	<1	<1	<1
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	0.9 J	<1	<1
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	<1	<1	<1

Analyses	14	14	14
Detections	8	0	0
Minimum Concentration	0.47	0	0
Maximum Concentration	3.9	0	0
HWAD - PCG	64	4	800
HWAD - PCG Hits	0	0	0

Notes:  
NE = Not established  
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Picric Acid  
Method 8330M (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Picric Acid mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	<0.25
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	<0.25
B30-HA1-3-005	HA03	3/28/91	5	ASC	<0.25
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	<0.25
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	<0.25
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	<0.25
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	<0.25
B30-HA1-1-000	HA01	5/12/94	0	ASC	<0.25
B30-HA1-1-005	HA01	5/12/94	5	ASC	<0.25
B30-HA1-2-000	HA02	5/12/94	0	ASC	<0.25
B30-HA1-2-005	HA02	5/12/94	5	ASC	<0.25
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	<0.25
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	<0.25
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	<0.25
Analyses					14
Detections					0
Minimum Concentration					0
Maximum Concentration					0
HWAD - PCG					NE
HWAD - PCG Hits					NE

Notes:

NE = Not established

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.



Nitrate Nitrite  
Method 9200 (ASC)

Sample ID	Location ID	Sample Date	Depth (feet)	Lab	Nitrate-Nitrogen mg/kg
B30-HA2-1-000	HA01	3/28/91	0.5	ASC	6.9
B30-HA1-3-000	HA03	3/28/91	0.5	ASC	4.2
B30-HA1-3-005	HA03	3/28/91	5	ASC	5.2
B30-CPS1-1-011	CPS01	4/2/91	11	ASC	1.6
B30-CPS1-1-018	CPS01	4/2/91	18	ASC	2.3
B30-CPS1-1-020	CPS01	4/2/91	20	ASC	12
B30-CPS1-2-022	CPS02	4/2/91	22	ASC	2.1
B30-HA1-1-000	HA01	5/12/94	0	ASC	6.7
B30-HA1-1-005	HA01	5/12/94	5	ASC	1.6
B30-HA1-2-000	HA02	5/12/94	0	ASC	7.8
B30-HA1-2-005	HA02	5/12/94	5	ASC	<1.3
B30-CPS1-2-012	CPS02	5/24/94	12	ASC	2.6
B30-CPS1-2-018	CPS02	5/24/94	18	ASC	<1.1
B30-CPS2-2-012	CPS02	5/25/94	12	ASC	3.1
Analyses					14
Detections					12
Minimum Concentration					1.6
Maximum Concentration					12
HWAD - PCG					128000
HWAD - PCG Hits					0

## **Appendix D**

Applied P & Ch Laboratory  
 13760 Magnolia Ave. Chino CA 91710  
 Tel: (909) 590-1828 Fax: (909) 590-1488

# APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result			
				CS11-SW-04 99-02449-17	CS30-BB-01 99-02449-18	CS30-BB-02 99-02449-19	CS30-BB-03 99-02449-20
NITROAROMATICS AND NITROAMINES							
Dilution Factor				1	1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.21	<0.21	<0.21
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.21	<0.21	<0.21
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
HMX	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
NITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
3-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
RDX	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
TETRYL	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26	<0.26

Component Analyzed	Method	Unit	PQL	Analysis Result		
				CS30-SA-01 99-02449-21	CS30-SA-02 99-02449-22	CS30-SW-01 99-02449-23
<b>MOISTURE</b>	ASTM-D2216	%Moisture	0.5	2.5	2.3	3.1
<b>NITROAROMATICS AND NITROAMINES</b>						
Dilution Factor				1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.21
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.21
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
HMX	8330	mg/kg	0.25	<0.26	<0.26	<0.26
NITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
3-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
RDX	8330	mg/kg	0.25	<0.26	<0.26	<0.26
TETRYL	8330	mg/kg	0.25	<0.26	<0.26	<0.26
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.26	<0.26

Component Analyzed	Method	Unit	PQL	Analysis Result		
				CS30-SW-02 99-02449-24	CS30-SW-03 99-02449-25	CS30-SW-04 99-02449-26
<b>MOISTURE</b>	ASTM-D2216	%Moisture	0.5	6.6	2.9	2.8

Applied P & Ch Laboratory

19780 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1458

**APCL Analytical Report**

Component Analyzed	Method	Unit	PQL	Analysis Result		
				CS30-SW-02 99-02449-24	CS30-SW-03 99-02449-25	CS30-SW-04 99-02449-26
NITROAROMATICS AND NITROAMINES (a)						
Dilution Factor				1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.21	<0.21
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.21	<0.21
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
HMX	8330	mg/kg	0.25	0.32	<0.26	0.26
NITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
3-NITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
RDX	8330	mg/kg	0.25	9.05	0.33	0.48
TETRYL	8330	mg/kg	0.25	<0.27	<0.26	<0.26
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26

Component Analyzed	Method	Unit	PQL	Analysis Result		
				CS30-SW-05 99-02449-27	SS22-99-01 99-02449-28	SS22-99-02 99-02449-29
<b>MOISTURE</b>	<b>ASTM-D2216</b>	<b>%Moisture</b>	<b>0.5</b>	<b>2.6</b>	<b>1.1</b>	<b>1.4</b>
<b>NITROAROMATICS AND NITROAMINES</b>						
Dilution Factor				1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.20
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.20
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
HMX	8330	mg/kg	0.25	<0.26	<0.25	<0.25
NITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
3-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
RDX	8330	mg/kg	0.25	<0.26	<0.25	<0.25
TETRYL	8330	mg/kg	0.25	<0.26	<0.25	<0.25
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25

PQL: Practical Quantitation Limit.

MDL: Method Detection Limit.

ORDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

" ": Analysis is not required.

J: Reported between PQL and MDL.

† All results are reported on dry basis for soil samples.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

(a) Positive results had been confirmed by second column.

Respectfully submitted,

Dimitrie Lau

Laboratory Director

Applied P &amp; Ch Laboratory

## **Appendix E**



B30, View across pit:  
December 1997



August 1999